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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,527	04/26/2001	Christian Fabry	P-1027	9706

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EXAMINER	
AFREMOVA, VERA	
ART UNIT	**PAPER NUMBER**
1651	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/830,527	FABRY ET AL.	
	Examiner	Art Unit	
	Vera Afremova	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-39 and 42-45* is/are pending in the application.

4a) Of the above claim(s) *45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *17-39 and 42-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of claims and Election/Restrictions

Claims 17-39, 42-44 and 45 (as amended and new) are presently pending [paper(s) filed 3/29/2004].

Claims 1-16 were canceled by applicants. [Paper No. 6 filed on 4/26/2001]. Claims 40 and 41 were canceled by applicants [Paper No. 13 filed 12/02/2002].

Newly submitted claim 45, drawn to a method for treatment of oils (Group III), is directed to an invention that is independent or distinct from the originally claimed invention of the elected Group I {response papers filed 6/04/2002}, drawn to a method of making activated layered silicates that corresponds to the instant claims 17-39 and 42-44 for the reasons as discussed in the prior office action {office paper(s) mailed 4/23/2002}. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, new claim 45 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claims 17-39 and 42-44 are under examination in the instant office action.

Claim Rejections - 35 USC § 112

New matter

Claims 17-39 and 42-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Insertion of the limitation drawn to pH value of a layer silicate "which has a pH value greater than 3.4" (claim 17) or "with a pH value greater than 4" (claim 43) has no support in the as-filed specification.

The insertion of this limitation is a new concept because it neither has literal support in the as-filed specification by way of generic disclosure, nor are there specific examples of the newly limited genus that would show possession of the concept of the use of the entire pH range as presently claimed.

The instant amendment encompasses the use of pH values of a layer silicate that is from 3.4 or from 4.0 to 14.0. There is no generic disclosure about pH value of generic layer silicates. There is some exemplified disclosure that demonstrates that an aqueous suspension comprising raw clay has pH value of 6.9 (see table 1) or a neutral pH value. There are some examples of non-sterile or inoculated clays that appear to have pH value of 3.4 (table 1). But there is no disclosure about any basic mineral materials that would fall within the presently claimed pH range from 3.4 or from 4.0 to 14.0.

This is not a sufficient support for the new genus that is an entire pH range from 3.4 or from 4.0 to 14. This is a matter of written description, not a question of what one of skill in the art would or would not have known. The material within the four corners of the as-filed specification must lead to the generic concept. If it does not, the material is new matter. Declarations and new references cannot demonstrate the possession of a concept after the fact. Thus, the insertion of the limitation drawn to pH value of a layer silicate "which has a pH value

greater than 3.4" (claim 17) or "with a pH value greater than 4" (claim 43) is considered to be the insertion of new matter for the above reasons.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 17, 23, 24, 26, 29, 30, 31-39, 43, 44 remain/are rejected under 35 U.S.C. 102(b) as being anticipated by Ryu et al. [Journal of Fermentation and Bioengineering. 1995, 80(1), 46-52] as explained in the prior office action.

Claims are directed to a process for increasing decolorizing activity of a layer silicate intended for further treatment of oils and waxes wherein the process comprises step of treating the layer silicate that has neutral pH value with an acid-producing microorganism until pH of not more than about 3.4 is obtained. Some claims are further drawn to the use of acid-producing microorganisms that are as sulfur-oxidizing bacteria or iron-oxidizing bacteria belonging to *Thiobacillus ferrooxidans* during the treating step in the process. Some claims are further drawn to addition of microorganisms to an inoculant material prior to treating step, to the use of microbial amounts such as 10^2 to about 10^{10} bacteria/g of the inoculant material. Some claims are further drawn to the use of water content during treating step at about 15-70%. Some claims are further drawn to the addition of inoculant material in amount 5-20% of the whole material during treating step. Some claims are further drawn to the addition of microbial nutrients including sulfur-containing products prior to treating step, to maintaining the temperature of the layer silicate during treating step from 20° C to 35° C or to aerating the silicate during the treating step in the process. Some claims are further drawn to a time period of the treating step from 1 day to 365 days. Some claims are further drawn to addition of acid to the layer silicate prior to treating with microorganism. Some claims are further drawn to breaking layer silicate into clumps of a size about 0.5-5 cm prior to treating step.

The cited reference by Ryu et al. is relied upon as explained in the prior office action and repeated herein.

The reference by Ryu et al discloses a process for treating clays or layer silicates by microbial removal of sulfur and iron wherein the process comprises step of treating the layer silicate or clay with sulfur-oxidizing bacteria and iron-oxidizing bacteria *Thiobacillus*

ferrooxidans (see abstract) until pH of not more than about 3.4 is obtained (see Fig. 6). The microbial cells are added an inoculant material prior to treating step in amount 10^9 bacteria per g or ml the inoculant material and the inoculant material is added in amount about 5% of the whole material or 5 ml to 100 ml of the MS medium with clay (page 47, col. 1, par. 2). The clay pulp densities that are used in the process of the cited reference are from 5-70% during the treating step and, thus, the water content during the treating step is about 30-95% or within the range as required for claimed method. The reference discloses that microbial nutrients including sulfur-containing products of the MS medium are added prior to treating step (page 47, col. 1, lines 1-3). The temperature is about 28°C during clay treatment (page 47, col. 1, par. 2). The incubation chamber or flask is held on a rotary shaker and, thus, the clay that is being treated with bacteria is aerated. The reference discloses the incubation period up to 12 days (fig. 6). The reference also discloses that initial pH is adjusted to about 2 before addition of bacteria (page 47, col. 1, par.) and, thus, it teaches the addition of acid to the layer silicate prior to treating with microorganism. In addition, it also teaches that the microbial growth inhibitors that might be present in the starting raw material can be removed by acid pretreatment (page 29, col. 1, par. 2). The reference also teaches crushing or breaking layer silicate into clumps of a size about 0.5 cm prior to treating step (see page 46, col. 2, at section "clay samples").

With regard to the cited reference by Ryu et al. Applicants' main argument is directed to the idea that the pH value of a starting suspension is adjusted to 2 in the prior art method of making activated layered silicates and, thus, the prior art method is not identical to the presently claimed method. Yet, the presently claimed method indicates that the layered silicate itself

should have the pH value of more than 3.4 including neutral pH. The claimed method does not requires that a starting mineral materials or a starting suspension comprising layer silicate that is treated with microorganisms is required to have pH above 3.4 or that it has never been treated with acid.

The generic raw clay material is reasonably expected to have about neutral pH. Thus, the starting raw clay materials of the cited reference are inherently characterized by the neutral pH value. Moreover, the original raw clay materials cannot be acid in the cited reference since they need pH adjustment to lower the pH value to meet microbial growth requirements.

The presently claimed method comprises one active step of treating the inherently neutral minerals with a microorganism capable to produce acid wherein the end product is characterized by acid pH of not more than about 3.4. The presently claimed method does not exclude steps drawn to the pH adjustment or modifications of the entire microbial culture system to meet microbial growth requirements by the virtue of the open language "comprising". Moreover, at least some of the claims require the addition of microbial nutrients and/or dilute acid (see claims 37-39).

Therefore, the cited reference is still considered to anticipate the claimed invention as amended because it discloses the same one active step of treating the originally neutral clays or layer silicates with the same acid-producing microorganisms as required by the claimed invention and because it results in the possession of the same end product that is layer silicate treated with microorganisms and characterized by acid pH. Thus, the final effects of the end product in the method of the cited reference are reasonably expected to be identical to the effects of the end product of the claimed method. Although the reference by Ryu et al is primary concerned with the removal of sulfur and iron from clays rather than increasing decolorizing activities of clays, the clays obtained by the method of Ryu would be inherently characterized by decolorized activity that is increased at least to some degree within the meaning of the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17-39 and 42-44 remain/are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2,813,821 taken with Rutkowski et al. [STN CAPLUS 1981:535117/an; Przemysl Chemiczny (1981), 60 (5), 287-289], Kusnierova et al. [Mineralia Slovaca (1996), 28:365-367; this is full text of the IDS-6/27/2002. cit. No. 1 or CA ref. 866899e], Chaudhury et al. [Erzmetall. 1990, 43 (5), 210-212] and Ryu et al. [Journal of Fermentation and Bioengineering. 1995, 80(1):46-52] for the reasons as explained in the prior office action.

Claims are directed to a process for increasing decolorizing activity of a layer silicate intended for treatment of oils and waxes wherein the process comprises step of treating layer silicate characterized by neutral pH with an acid-producing microorganism until pH of not more than about 3.4 is obtained. Some claims are further drawn to the use of the various layered silicates including bentonite, montmorillonite, to the use of various acid-producing microorganisms including *Aspergillus niger* and *Thiobacillus sp.* Some claims are further drawn to the use of inoculant material at particular amounts, to addition of microbial nutrients, to the use of conditions including amount of water, temperature, aeration, period of incubation, size of materials under treatment and to the pretreatment of materials.

The cited references are relied upon as explained in the prior office action and repeated herein.

US 2,813,821 teaches a method of making a porous absorbent material by microbial treatment wherein initial porous material is treated with microbial fluid including microbial cells or filaments in order to change or to improve the properties of the porous material such as increasing effective surface area to the volume of the porous material (col. 1, lines 15-30 and lines 56-60; col. 2, lines 35-50). The improved porous material of the cited patent is intended as "catalyst" for the processes employing conversion of hydrocarbons or oils, fats and waxes (col. 2, lines 35-39) and/or absorption (col. 2, line 48).

The teaching of the cited patent US 2,813,821 is not particularly clear with respect to the decolorizing activity of final porous materials having the improved/increased surface to volume ratio. However, the reference by Rutkowski et al demonstrates that it is known in the prior art that the improved porosity of the absorbent material is directly related to the decolorizing power of the porous materials including the oil decolorizing power of clays. See English abstract of the reference by Rutkowski et al.

In particular, the cited patent US 2,813,821 teaches a treatment of silica or silica alimuna with microorganisms including acid-producing *Aspergillus niger*, for example: see col. 6, lines 40 and line 54. According to the applicants definitions the "silica" porous materials of US 2,831,821 are not clays and are not "layered silicates" (response filed 12/02/2002, pages 11-12 or page 5, last paragraph).

Thus, US 2,813,821 is lacking disclosure of clays or layered silicates including smectite, montmorillonite, bentonite and palygorskite as materials under microbial treatment. However, the cited US 2,813,821 clearly suggests that other their porous materials that are regularly employed during absorption procedures, including conversion of hydrocarbons, can be treated with microorganisms and improved with regard to their porosity or absorbent capacity/activity.

The reference by Rutkowski et al demonstrates that it is known in the prior art that the decolorizing power of clays is improved through increasing surface area of their pores.

Further, the reference by Kusnierova is relied upon to demonstrate that clays or layered silicates including montmorillonite and bentonite are effectively treated and destructed with microorganisms including acid-producing microorganisms *Aspergillus niger* and *Thiobacillus* (see abstract).

The cited patent US 2,813,821 teaches that the initial porous materials are subjected to microbial treatment under conditions suitable for microbial growth in order to improve porosity of materials. The suitable conditions including pH, nutrients, aeration and temperature are adjusted with respect to the microorganism that is employed in the method (col. 4, lines 4-32). The cited patent indicates some generic pH for growing generic microorganism. But it is lacking disclosure related to a particular pH value of 3.4 and below.

However, the cited reference by Ryu et al. teaches that optimal pH for growing *Thiobacillus* is 2-4 (page 46, col. 2, par. 2) and that the clays are treated by *Thiobacillus* until pH is no more that 3.4 (fig. 6).

Further, the reference by Chaudhury et al. demonstrates that the culture filtrates derived from *Aspergillus niger* with pH 3.5 are used for clay treatments (see abstract and page 210, col.2, lines 1-5).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to treat layered silicates or clays with microorganisms including acid-producing microorganisms with a reasonable expectation of success in increasing decolorizing activity of clays because the decolorizing activity of clays is directly related to their porosity and absorbent capacity and because the microorganisms including acid-producing microorganisms are suitable for improving porosity of materials. One of skill in the art would have been motivated to use acid-producing microorganisms including representatives of the genera *Thiobacillus* and Aspergillus for the expected benefits in degrading or destructuring mineral-containing materials including clays because these microorganisms are known and have been demonstrated as capable to grow on clays and to be effective to degrade, bleach and destructure clays and, thus, to increase porosity of clays. One of skill in the art would have been motivated to treat clays with microorganisms under acidic conditions or until acidic conditions are about 3.4 or below because these acidic conditions are the growth requirement of microorganisms including *Thiobacillus* or *Aspergillus* that have been used for clay degradation and/or destructuring. One of skill in the art is free to select between various clay materials including bentonite, montmorillonite or others because the clay materials can be destructured by microorganisms as adequately demonstrated by the prior art. The temperature, aeration, nutrients, amounts of microbial cells, amounts of water, time period for incubation are adjusted with regard to culturing of a particular microorganism employed in the process and, thus, optimization of the process with regard to the microbial growth requirement and conditions is reasonably considered to be within the purview of the ordinary skill practitioner. Thus, the

claimed invention as a whole was clearly prima facie obvious, especially in the absence of evidence to the contrary.

The claimed subject matter fails to patentably distinguish over the state art as represented be the cited references. Therefore, the claims are properly rejected under 35 USC § 103.

With respect to the claim rejection under 35 USC 103 applicants appear to argue that USPTO has a basic misunderstanding of the applicants' process (response page 15, last par.). That is not quite so because the claims are regarded as being drawn to a method of making an activated clay mineral product by action of microbial acid and, thus, the instant claims are given the same interpretation as summarized by applicants (page 16, par. 2). However, the claimed subject matter fails to patentably distinguish over the state art as represented be the cited references.

The cited prior art clearly demonstrates that it is known to treat and, thus, to activate clay minerals including layer silicates with acid-producing microorganisms or with microbial acids {Kusnierova et al., Chaudhury et al. and/or Ryu et al.}. The cited US 2,813,821 {Updergraff} taken with Rutkowski et al. provides for a generic teaching of the mineral treatment process that leads to understanding and suggestion that activation or increase of decolorizing activity of clay minerals is associated with increase of the surface area or increase of mineral porosity.

Applicants also appear to emphasize criticality of the pH value of greater than 3.4 prior to treatment and less than 3.4 after the treatment in the presently claimed method. However, the applicants' invention as disclosed encompasses another ranges for the desired degree of clay activation such as pH of the final product between 2-4 (specification page 7, par. 2). The pH value of a staring material as disclosed appear to be the same as it would be for a raw clay mineral such as neutral pH. The prior art starting materials {Kusnierova et al., Chaudhury et al. and/or Ryu et al.} are inherently characterized by neutral pH and the prior art final products are inherently characterized by the same final pH value because the same clay minerals are treated with the same acid-producing microorganisms as the applicants' microorganisms and/or because the clay minerals are activated by the action of microbial metabolites that clearly have the same pH value (as demonstrated by Chaudhury et al., for example).

Thus, in response to applicant's argument that the references by Kusnierova et al., Chaudhury et al. and/or Ryu et al. is not nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the cited references disclose substantially similar methods of treating clay minerals wherein the final clays products are obvious variants, if not identical, to the applicants' final products.

Furthermore, in response to applicant's argument that the references by Kusnierova et al., Chaudhury et al. and/or Ryu et al. do not suggest that their final products might be useful for oil decolorization, it is noted that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Afremova whose telephone number is (571) 272-0914. The examiner can normally be reached from Monday to Friday from 9.30 am to 6.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached at (571) 272-0926.

The fax phone number for the TC 1600 where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

Vera Afremova

AU 1651

V. Afremova

June 3, 2004

VERA AFREMOVA

PATENT EXAMINER